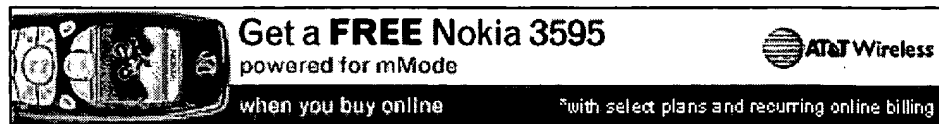


L Number	Hits	Search Text	DB	Time stamp
-	189	348/345.ccls.	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/08 16:50
-	273	(back\$1ground and fore\$1ground) same focus\$4	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/07 11:53
-	220414	(divid\$3 or separat\$4) near5 (zone\$1 or block\$1 or area\$1)	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/07 11:55
-	48	((back\$1ground and fore\$1ground) same focus\$4) and ((divid\$3 or separat\$4) near5 (zone\$1 or block\$1 or area\$1))	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/07 11:56
-	177	((back\$1ground and fore\$1ground) same focus\$4) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/07 12:45
-	61	shift\$3 near5 (focus\$3 adj3 zone\$1)	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/07 16:06
-	7799	back\$1ground and for\$2ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/08 15:51
-	305371	focus\$4 or auto\$1focus\$4 or (automatic\$4 adj focus\$4)	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/08 15:53
-	64	distance same (focus\$4 or auto\$1focus\$4 or (automatic\$4 adj focus\$4)) same back\$1ground same for\$2ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/08 15:57
-	59	(distance same (focus\$4 or auto\$1focus\$4 or (automatic\$4 adj focus\$4)) same back\$1ground same for\$2ground) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/08 15:57
-	75	((soft adj focus\$4) or (out\$1of\$1focus)) near7 back\$1ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 14:57
-	52	((soft adj focus\$4) or (out\$1of\$1focus)) near7 back\$1ground) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 09:02
-	154	((soft adj focus\$4) or (out\$1of\$1focus)) same back\$1ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 09:32
-	112	((soft adj focus\$4) or (out\$1of\$1focus)) same back\$1ground) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 09:22

-	24	("4855777"   "4908645"   "4969003"   "4972221"   "4974002"   "4974003"   "4980716"   "5005037"   "5060002"   "5061951"   "5061953"   "5079581"   "5081479"   "5089843"   "5126777"   "5151732"   "5216460"   "5333028"   "5382996"   "5585882"   "5721967"   "5771413"   "5839001"   "5864721").PN.	USPAT	2002/05/09 09:25
-	0	6175692.URPN.	USPAT	2002/05/09 09:30
-	391	((soft adj focus\$4) or (out\$1of\$1focus) or de\$1focus\$4) same back\$1ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 11:35
-	234	((soft adj focus\$4) or (out\$1of\$1focus) or de\$1focus\$4) same back\$1ground) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 09:37
-	260	de\$1focus\$4 same back\$1ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 11:37
-	134	(de\$1focus\$4 same back\$1ground) and camera\$1	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 11:39
-	22	("4749848"   "4827303"   "4943824"   "4980716"   "4992817"   "4994843"   "5005041"   "5091742"   "5121151"   "5138358"   "5307112"   "5311241"   "5361119"   "5410383"   "5473403"   "5568222"   "5604562"   "5615398"   "5737642"   "5887200"   "5890021"   "5913082").PN.	USPAT	2002/05/09 11:47
-	391	(de\$1focus\$4 or (soft adj focus\$4) or (out\$1of\$1focus\$4)) same back\$1ground	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 14:45
-	131	(sharp\$2 or in\$1focus\$4) near7 (for\$1ground or (main adj object\$1))	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 14:45
-	24	((de\$1focus\$4 or (soft adj focus\$4) or (out\$1of\$1focus\$4)) same back\$1ground) and ((sharp\$2 or in\$1focus\$4) near7 (for\$1ground or (main adj object\$1)))	USPAT; US-PGPUB; EPO; DERWENT; IBM_TDB	2002/05/09 14:45



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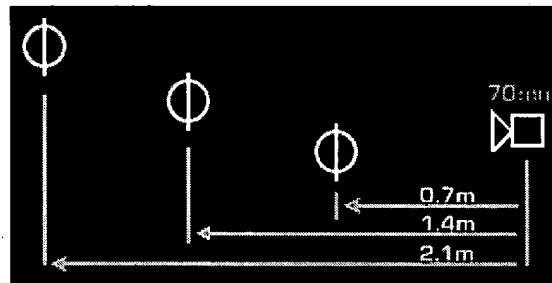
## Learn : Glossary : Optical : Depth of field

### Depth of field

By Phil Askey

Depth of field is a term which refers to the areas of the photograph both in front (closer to you, about 1/3 of the DOF) and behind (further away, about 2/3 of the DOF) the main focus point which remain "sharp" (in focus). Depth of field is affected by the aperture, subject distance (closer subjects produce a shallower depth of field), and focal length (shorter focal lengths produce larger DOF, thus a 28mm lens at f/5.6 produces a greater depth of field than a 70mm lens at the same aperture).

Put simply, a larger aperture (smaller f-number, eg. f/2) has a shallow depth of field, anything behind or in front of the main focus point will appear blurred. A smaller aperture (larger f-number, eg. f/11) has a greater depth of field, objects within a certain range behind or in front of the main focus point will also appear sharp.



This is the setup which was used to produce the example below, three postcards 0.7m apart, the camera, a Canon Pro 70 set at its maximum telephoto (70mm) focused on the first card.



As you can see at a large aperture of f/2.4 only the first card is in focus, at f/8 the middle card is sharp and the distant card is almost sharp. (Click the image for a larger version)

There is an added technique you can use to gain more depth of field, you'll note that above I quoted that 1/3 of the depth of field is in front of the focal point and 2/3 is behind, knowing this you could focus "in front" of the main subject (closer to you) and still render them as sharp as they fall into that large 2/3 of the DOF. The full SIZE of the DOF depends on the attributes noted above (aperture and subject distance).

### Depth of field calculator

Remember: focal length multipliers DO NOT effect depth of field, they only "crop" a center portion of the frame.

Negative format   
 Lens focal length   
 Selected aperture   
 Subject distance (Meters)

Hyperfocal distance for this lens/aperture combination Near limit of acceptable sharpness Far limit of acceptable sharpness Total depth of field 

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